



SPACELAB EXPERIMENT — SMD III payload specialist Dr. Carter Alexander of JSC dissects and inspects a frog during one of the life sciences experiments conducted during the Spacelab simulation here.

Spacelab simulation ends at JSC, another continues in California

One Spacelab simulation ended at JSC Monday while another was still under way out in California.

Three life sciences specialists ended their seven-day ground-based simulation at 1 p.m. Monday. Life Sciences Spacelab Mission Development III (SMD III) was conducted at JSC's Bioengineering and Test Support Facility.

Drs. William E. Thornton, Carter Alexander and Bill A. Williams lived aboard the high-fidelity mockup of the Spacelab and Shuttle Orbiter crew deck throughout the week-long test.

Thornton, an astronaut-physician, was mission specialist. Alexander and Williams were payload specialists. Thornton and Alexander are from JSC while

Williams is from Ames Research Center, Calif.

Spacelab is under development by a consortium of ten European nations and will be carried into space in Shuttle Orbiter's 15 x 65-foot payload bay. A wide range of scientific, medical and engineering experiments will be flown aboard each Spacelab mission.

Spacelab life sciences payloads, similar to the developmental experiments in the week-long simulation, will be aimed toward determining the effects of the space environment on living organisms and improving space crew health care during future space exploration missions.

Additionally, the payloads will be used to develop life support systems for people living and working in space and applications of space technology toward clinical research and health care on Earth.

Medical monitoring and health services for the SMD III crew was provided by Dr. Thornton.

A "rack" of 20 life sciences experiments was developed and built at Ames and shipped to Houston for the simulation. An additional six JSC experiments were run during the test.

As the SMD III crew neared the end of its simulation last weekend, they conducted human cardiovascular and respiration tests and measurements of tolerance to motion sickness.

SMDs I and II were held at JSC in October 1974 and January 1975.

At Ames Research Center in California, a ten-day Airborne Science-Spacelab Equipment System Simulation II (ASSESS II) was scheduled to end Thursday.

Astronauts Karl Henize and Robert Parker, both of JSC, were mission specialist and backup mission specialist, respectively, for that joint NASA-European Space Agency simulation.

The ASSESS II mission was flown in the Galileo II, a Convair 990 four-jet transport converted to a sophisticated flying laboratory.

Four payload specialists, two from NASA and two from ESA, performed experiments gathering data in the fields of Earth resources, medicine, atmospheric pollution monitoring and infrared astronomy.

Spacelab is one of the major payloads being developed to fly aboard Shuttle flights in the 1980s.

United States, Soviet Union agree to more space effort cooperation

NASA and the USSR Academy of Sciences have agreed on further cooperation in the area of manned space flight.

The agreement was signed May 6 by Dr. Alan M. Lovelace, acting administrator of NASA, and May 11 by Anatoly P. Aleksandrov, president of the Academy of Sciences of the Soviet Union.

The agreement is designed to provide continuity of the joint technical, scientific and operational capability developed through the highly successful Apollo-Soyuz rendezvous and docking mission conducted in July 1975.

Three joint working groups will prepare recommendations for two

new programs, one dealing with orbital manned flight activities and the other with a possible future international space station.

The first working group will begin studies soon on scientific and applications programs that may be conducted in joint operations of the American Space Shuttle and the Soviet Salyut space station in the early 1980s. A second working group simultaneously will develop plans for these joint operations.

The two groups will seek to define projects which might benefit from the flexible delivery capability and large capacity of the Space Shuttle and the capability for longer stay-time in orbit represented by the Salyut.

The emphasis will be on a "science first" program which will take advantage of these capabilities and fully justify the contemplated joint operation.

It is anticipated that the studies of the Shuttle/Salyut program will be completed within 18 - 24 months, producing recommendations for consideration by both sides.

The agreement also establishes a third joint working group to conduct a series of phased studies of an international space platform, or station.

If such studies develop consensus on the objectives of future space stations, further studies would be undertaken to explore possible agreement on the conceptual design of the stations.

Neither side is committed to steps beyond the initial studies and each reserves the right to proceed with its independent national space station interests.

First captive active flight is rescheduled

The first manned test flight of the Space Shuttle Orbiter originally scheduled for May 26 was rescheduled for no earlier than June 9 at Dryden Flight Research Center, Calif.

The exact date of Captive Active 1, which begins the second phase of Shuttle Approach and Landing Tests, is dependent upon successful completion of Orbiter ground tests. Those included the simulated flight run, the final stage of the "hot fire" scheduled for last Tuesday.

The captive active tests are designed to verify the aerodynamics and flight control characteristics of the Orbiter (Enterprise) while still attached to the 747 carrier aircraft.

The postponement is due to delays in verification testing, systems

checkout and previously unscheduled modifications of the Orbiter following the first Orbiter/747 flights completed in early March.

These included, among others, Auxiliary Power Unit (APU) changeout, elevon actuator changeout, APU lubrication changeout, crew ejection seat modifications, wiring change requests, electrical power outages, software changes and modifications to the tailcone.

There are now four scheduled captive active flights with Fred Haise and Gordon Fullerton slated to fly the first and third and Joe Engle and Richard Truly the second and fourth.

The free flight phase of ALT is now scheduled to begin in mid-August.

Agency decides to purchase 6 satellite-launching upper stages

NASA has decided to purchase six spinning solid upper stages (SSUSs) to permit delivery of spacecraft from an orbiting Space Shuttle to higher Earth orbits.

This marks initiation of the agency's first procurement action following agreements earlier this year with two aerospace firms, permitting them to design, test and manufacture the upper stages and market them independently.

A request for proposals was



SMD III CREW — Crew members for the Spacelab Mission Development III simulation which ended its seven-day run at JSC Monday were, l to r, Dr. Carter Alexander of JSC, payload specialist; Astronaut-physician Dr. William E. Thornton of JSC, mission specialist, and Dr. Bill A. Williams of Ames Research Center, payload specialist.

issued May 13 for six SSUS-A vehicles to place Intelsat V type spacecraft into stationary orbits, with an option for purchasing an additional two.

The "A" designation indicates the vehicle's capability to deliver payloads of the size now being launched by the expendable Atlas/Centaur rockets.

Bids on the procurement action will be limited to two firms, McDonnell Douglas Corp., Hunting-

ton Beach, Calif., and Boeing Aerospace Co., Seattle.

Both companies entered into agreements with NASA, committing them to develop the stages with private funds. This is the first time NASA has procured rockets or rocket stages in this manner. Normally the agency incurs development and production costs as part of the procurement agreement.

(Continued on page 2)

Directory changes due June 3

Any suggested changes in JSC Telephone Directory listings to be included in the July issue are due in JM33/Telecommunications Section by June 3.

Changes to the alphabetical section should be submitted on JSC Form 149.

Organizational changes should be submitted on bond paper in the format contained in the directory.

Organizations responsible for information in the Classified Section should review that information and submit any changes required.



TWICE A WINNER — Edna D. McAnelly receives certificates from James Neal, director of Procurement, left, and H. T. Christman, small business specialist, right, naming her as the Fiscal Year 1977 Small Business Set-Aside Buyer whose cooperative efforts resulted in "the largest dollar volume" and "the largest number" of individual set-asides processed by a single buyer during the year. This is the sixth year the awards have been presented. They usually go to two individuals.

JSC wins 2 and 4-mile events in intercenter running contest

Johnson Space Center won on overall points both the 2-mile and 4-mile events in the 3rd NASA Intercenter Running Competition.

Twenty-seven JSC joggers scored among the top 10 NASA-wide in their age groups and took six individual first-place honors.

JSC scored 125.5 points in the 2-mile for an easy win over Ames Research Center which took second with 107.5 points.

There was no contest in the 4-mile where JSC totalled 124.0 points while Ames and Lewis Research Centers tied for second with 75 points each.

A total of 464 runners took part in the competition when events were run at the individual centers April 24 and 26. JSC had the best participation with 119 joggers.

High scorers for JSC were:

Danya Grieder, 1st in the 2-mile (12:44) and 4-mile (27:38) for Women 29 and Under. Her 2-mile time was fastest of any woman running. Points: 20.

Claud Edmiston, 1st in the 2-mile (10:49) and 2nd in the 4-mile (23:09) for Men 40-49. Points: 19.

Jack Alexander II, 2nd in the 2-mile (10:56) and 4-mile (23:08) for Men 19 and Under. Points: 18.

Jim Gilbert, 2nd in the 4-mile (22:42) and 3rd in the 2-mile (10:43) for Men 30-39. Points: 17.

Sue Dragich, 2nd in the 2-mile (13:36) and 4th in the 4-mile (30:48) for Women 29 and Under. Points: 16.

Linda Chaput, 2nd in the 4-mile (33:12) and tied for 4th in the 2-mile (16:11) for Women 30-39. Points: 15.5.

Rele Evans, 4th in the 2-mile (12:05) and the 4-mile (26:11) for Men 50-59. Points: 14.

Tandi Benson, 3rd in the 4-mile (30:40) and 6th in the 2-mile (14:17) for Women 29 and Under. Points: 13.

Sue Kieffer, 1st in the 4-mile (26:19) for Women 30-39 and fastest 4-mile time of any woman running. Points: 10.

Bruce King, 1st in the 4-mile (22:36) for Men 19 and Under. Points: 10.

Sue MacDonald, 1st in the 2-mile (13:51) for Women 30-39. Points: 10.

Lou Schiavo, 5th in the 4-mile (23:36) and 7th in the 2-mile (11:12) for Men 30-39. Points: 10.

Other JSC point scorers were Ed Michalik and Reita Smith, 8; Tom Tilghman, 7; Kitty Havens and Rex Martin, 6; Ed Gibson, 5.5; Sandra

Krchnak, 5; Jan Burns, 4; Scott Krchnak and Lyndon Powell, 3; George Abbey Jr. and Bill Kimzey, 2; Herb Cottle, 1.5; Jim Abbey and John Rector, 1.

Russian organization honors 20 from JSC

Eighteen JSC employees and two contractor employees have been presented awards on behalf of the USSR Aeronautical Sporting Federation in recognition of their contributions to the success of the Apollo Soyuz Test Project.

Receiving S. Korolev Medals and Certificates were Jay F. Honeycutt, Flight Operations Directorate; James R. Jaax, Crew Systems Division; Thomas O. Ross, Spacecraft Design Division; Paul W. Shores, Tracking & Communications Development Division, and Richard L. Haken, TRW Defense & Space Systems Group.

Presented Yuri Gagarin Diplomas were Donalyn E. Dietz, Shuttle Payload Integration & Development Program Office; Robert L. Grafe, Crew Systems Division; David S. Grissom, Spacecraft Design Division; James S. Kelley, Tracking & Communications Development Di-

LeBarian Stokes named outstanding June Co-op

LeBarian Stokes, a sophomore aeronautical engineering major from the University of Alabama, has been named JSC Cooperative Education Student of the Month of June.

Stokes has been assigned to the Engineering Analysis Division. Bruce G. Jackson, division chief, nominated him for the award.

During his current co-op period, Jackson said, Stokes' first task was to analyze the effects of RCS plume impingement to various proposed orbiting payloads.

"To do this involved the use of a complex computer program with which he was totally unfamiliar," Jackson said. "However, (Stokes) quickly learned the basics of the program and within a short time was able to write a modification to the program that measurably increased its capability.

"LeBarian's most impressive accomplishment, however, has been his work with aerodynamic data from several SRB separation wind tunnel tests," Jackson said.

"Due to the condition of the data, his work entailed the creation of a significant amount of data through interpolation and extrapolation which involved the use of a sophisticated graphics computer, the ADAGE AGS 340.

"The task required that LeBarian exercise a degree of judgment somewhat beyond his aerodynamic experience," Jackson said. "It was also necessary that he be able to grasp the concept of four-dimensional hypercubes (used in data arrangement) which is beyond almost everyone's aerodynamic experience."

Stokes has performed exceptionally, shown enthusiasm and pride in his work, grasped complex concepts easily and always striven to understand the theory behind the task, Jackson concluded.

Upper stages...

(Continued from page 1)

The purchase of six SSUS-A upper stages will include all the hardware, analyses, logistics and services necessary to accomplish the successful injection of the spacecraft into its proper transfer orbit after the Space Shuttle Orbiter has placed the SSUS and its spacecraft into the proper injection position and orientation.

Under terms of the proposed contract, the contractor will have responsibility for production of the vehicles, the services and safe and proper operations of the SSUS-A systems.

The first of the six SSUS-As is to be delivered to NASA for a launch in December 1979 for a demonstration flight. Three other stages will launch Intelsat Vs, Comsat advanced communications spacecraft. The remaining two will be held in reserve for other mission assignments.

Historian to research astronautics

Dr. Roger E. Bilstein, of the University of Houston at Clear Lake City, has been awarded a grant by the National Air and Space Museum of the Smithsonian Institution in Washington to spend a year at the museum, researching and writing a survey of American aviation and astronautics.

A historian, Dr. Bilstein has written and researched extensively on the history of technology, especially aviation and astronautics. He wrote the official NASA history of the Apollo/Saturn launch vehicles and is the director of the UH/CLC Aviation Education Research Center.

Former astronaut Michael Collins is director of the National Air and Space Museum.

Astronaut applicants near 3000

The Astronaut Candidate Program Office reported May 20, that 2,996 applications have been received for civilian astronaut pilot and mission specialist candidate positions. Of those, 457 were from women.

Of a total 18,996 applications and announcements mailed out by request, 248 went to JSC employees.

Civilian applications must be postmarked no later than June 30, 1977. For information, write the Astronaut Candidate Office, AHX.



ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

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GETTIN' IN THE SWING — Dancers and musicians provided lively entertainment at the EAA Picnic May 7. If you missed this one, there's always next year.



PICNIC FUN — Sno-cones, pretty girls, and a clown making balloon animals for the little ones. These were among the main ingredients of the EAA Picnic held May 7 at the Gilruth Recreation Center grounds. Hundreds of JSC and contractor employees and their families turned out for the event.

EAA ATTRACTIONS

TICKETS

The following tickets are available at the Bldg. 11 Exchange Store from 10 a.m.—2 p.m., Monday — Friday:

Astroworld — Adult & children tickets available for \$6.95 each. That's a \$1 discount.

Dean Goss Dinner Theater — Comedy production, *Agatha Made Me Do It*. Tickets \$16/couple available for any night except Monday, Saturday.

Disney Magic Kingdom Club — Free membership cards.

Funseeker Cards — Free Six Flags/Astroworld discount cards good for \$1 off regular admission price when tickets are purchased at the gate.

Sea-Arama Marineworld — Tickets on sale. \$3.75 for adults, \$2.50

for children. Open until dusk, year round.

Six Flags — Adult & children tickets. \$6.75 each. That's a \$1.20 discount.

AERO CLUB ADDS SKYHAWK

The JSC Aero Club has added a 1975 Cessna Skyhawk II to its fleet. The airplane is IFR equipped, with dual nav-com radios, glide slope, digital ADF, transponder and three-way adjustable front seats.

Rate for the Skyhawk II is \$18/hr. The Cessna 150 (\$14/hr) and the P-Bonanza (\$27/hr) are also available.

Openings are still available in both the Cessna and Bonanza sections of the club. For information, contact Jackie Bohannon, X-4161.



REGISTRATION DEADLINES

Sign-up for summer softball leagues continues through June 3.

June 6 is registration deadline for beginning oil painting classes, \$30/person.

July 1 is sign-up deadline for group tennis lessons, \$30/person.

Registration for Super Teams competition begins July 18.

For further information, contact the Gilruth Recreation Facility, X-3594.

NEW YOGA CLASS

Due to the success of the current yoga class, a second class will be offered on Tuesday nights, June 7, 14, 21 and 28.

Registration will be May 31-June 3. Cost is \$30/person. Call the Rec Center for information, X-3594.

Roundup Swap Shop

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

CARS & TRUCKS

72 Ford F-250 Pickup. 360, 2 bbl, all pwr, auto, air, sleeper/passenger compartment, xtra clean. Pringle, 482-7160.

72 Ford Gran Torino Brougham. 351-V8, all pwr, air, AM/FM stereo, vinyl top. \$1,295. Larsen, X-2118 or 334-3432.

72 Pinto Hatchback. Air, auto, good tires, 25 mpg plus. \$875. 482-7029 after 5.

73 Plym Gran Fury. 4 dr HT, full equipt. \$1,380. 482-7029 after 5.

72 Pont Grand Ville. Vinyl top, stereo, steel radials, pwr incl windows, seat, tilt whl, cruise. Orig owner, wife's car. \$2,000. Sterling, X-4524 or 488-1380.

74 Chevy Impala. 4 dr, air, auto, AM radio, pwr, good cond. Bobko, 334-1437.

76 Cadillac Seville. Silver on silver, loaded, xint cond. \$9,600. 488-3377 after 5.

72 Honda 600 Sedan. Yellow, 43K mi. \$825. Erickson, 488-1901.

71 Vega Hatchback. New eng & clutch, dash mtd CB, AM/FM/8-trk stereo, headers, xint cond, 25 mpg avg. \$1,100. Mangieri, X-5107 or 488-5471.

66 Dodge SWB Sportsman Window Van. 6 cyl, std, camperized, runs great. \$995. Walker, X-4691 or 332-5658.

75 Pont LeMans Sport Coupe. V8, loaded, xtra clean, 27K mi. \$3,950. Jimmy, X-2961 or 554-2442.

71 Int'l Model 1010 Travelall. Air, auto, pwr, new tires, trir hitch, radio, clean. Burgett, 482-7945.

furn. Facil incl tennis, pool golf, boat launch. By wk or mo. 488-3746 after 5.

Sale: 10 acres, lg mobile home compl furn. Access to 12 acre lake, Old Hwy 75, 1/2 way to Dallas, wooded & garden trails, shrubs, next to 1800' landing strip. \$35,000, will carry note. Haynes, 214/729-0513.

Rent: Luvly 3 bdrm home, Camino South. Landscaped, fireplace, fenced, new appliances & paint. Avail June 15. \$450/mo. Allgeier, 474-3961.

Rent: 4-2-2, El Camino South, CLC. 2000 sq ft, lg family rm w/firepl, fenced bkyd. \$425. Call collect 512/385-4476.

Galveston West End. 2 bdrm By-the-Sea condo apt, full furn. \$180/wk off season, \$260/wk in season. Clements, 474-2622.

Reserve for summer vacation now. Jamaica Beach, Galveston. New 2 story. \$175/wk. 334-1640 after 5.

Pr of 5 lb ankle weights, good for jogging, exercise. \$8. 488-4005.

New Northwestern Bob Murphy Golf Clubs. 1, 3, 4 woods, 3-9 irons, pitching wedge. \$100. 946-7415.

Four G78-14 Goodyear Steel Belted Radial Tires. Used 8000 mi. 482-5926 after 6.

23" Color Zenith TV, barely works, \$25. 10-spd boy's bike, xint, \$30. Red wagon, \$3. Small tricycle, \$3. Smith, X-4468 or 488-3238.

One almost new F78-14 steel belted Dunlop tire. Firm \$12, a \$38 value. Sam, X-2553.

Two child carrier seats for bicycle. Mount over rear wheel. \$3 ea. 488-4463.

Shop manual for 68 Ford Mustang. \$5. Bartosh, X-4039 or 333-3690.

Power supply — 115 volts in; 5 volts at 6.0 amps, 6.3 volts at 3.0 amps, 850 volts at .23 amps out. \$10. Pitts, X-6478 or 488-3276.

Nikonos underwater camera incl attachments & flash. Perf cond. \$125. Mobley, X-4428 or 334-5101.

PETS

Free Kittens. 8 wks old. 488-4463.

Free 6 wk old puppy. 944-5033.

Male Afghan Hound. Apricot, 2 yrs, 3 mos AKC reg, champion blood, xint show. \$500. Cindy, X-7236.

Male black cat. 8 mo old, neutered, very affectionate, \$10. Cindy, X-7236.

MUSICAL INSTRUMENTS

Hammond Spinet Organ. Good cond, used by adults. 481-8237 after 6.

Standard Yamaha Guitar, FG 160 w/case. \$100. 944-5033.

WANTED

Directives Office needs green file labels. Will trade any other color. Call X-2260.

Want Big Wheel boat trailer for 16' ski boat. Alford, 474-2738.

Young married responsible couple wants to rent small house, apt or duplex in W. University area. No children. Avail June 1. Barnes, X-2846.

Want used tricycle, good cond. For 3 yr old. Linda, X-2681.

HOUSEHOLD ARTICLES

Admiral Microwave Oven w/700 watt Magnetron. Never used. Cost \$450, take \$250 334-1619.

Refrige/freezer 18.2 cu ft, copper-tone. Good cond (freezer blower intermittent). \$90. 482-7138 after 5:30.

Bar, walnut grained w/black top, 2 stools, \$35. Toaster oven, \$10. Thompson, X-5987 or 482-6550.

Lady Kenmore washing machine. \$45. 944-5033.

Antique white brocade drapes, 8 prs. Cost \$1500, sell \$200/all or \$30/pr. Wrought iron traverse rods, like new, 1 full wall, 4 shorter, \$50/all. Stovall, X-2231 or 474-4877.

White plastic etagere, 72" tall, \$30. Yellow plastic parson's tables, \$5/small, \$15/lg. Wicker plant stands, \$8. Chest o'drawers, dresser, mirror, \$100/all. King size wicker headboard, \$15. Twin mattress, spgs, frame, \$10. Studio couch w/trundle bed, \$25. Occas chair, needs cover, \$10. Stovall, X-2231 or 474-4877.

Lady Kenmore Elec Dryer. 471-0262 after 5.

17" B&W RCA TV, good cond. \$45. Maley, X-6457.

MISCELLANEOUS

Airplane: 25% share in 1972 IFR-equipped Grumman Amer Traveler. Nieder, 474-3517 evngs.

Four 15" Chevy truck wheels, tires & delux hub caps. \$70/all. Mobley, X-4428 or 334-5201.

Class II trailer hitch for 1972 GM car. Service manual for 72 Olds. 944-5624.

AMF-Wing 30 lb target bow w/sight, arrows & all access. Perfect. \$25. 488-3966.

JSC crossword

(See answers page 4)

ACROSS

1. Deed
4. Ascent
7. Cigarette smoke components
9. Astronaut — Mitchell
10. Give off
11. Bring to pass
12. Cargo
13. Like
15. Ojective pronoun
16. Ten manned missions
18. — tu, Brute
19. Most frequent value
22. Negative prefix
23. Comfortable
24. Mountain range
25. 19th Cent. American writer

DOWN

1. Corroded
2. Rotating or sliding part
3. Voyage
4. Simultaneous reporting
5. Alleged seat of psychic energy
6. Destroy by degrees
8. Assigned positions

1	2	3			4	5		6
7			8		9			
10							11	
		12						
13	14						15	
16						17		
18					19		20	21
		22			23			
24							25	

11. Block
13. Gemini docker
14. Harden
17. Cleanser

20. Docking System Operator (acronym)
21. Storm center
22. Raised



This trailer houses Water Monitor System developed at JSC

Automatic Water Monitor System ends field tests at Houston plant

An automatic Water Monitor System developed at JSC has been analyzing wastewater since mid-March at the Southwest Houston treatment plant near Bellaire.

The system, called WMS, has operated 24-hours a day, five days a week while being field tested at the facility. Testing was scheduled to end today.

WMS includes the necessary sensors, sample collection system, and data acquisition and display system to monitor in "real" or "near real time" the discharges from water or wastewater treatment plants and provide water quality data.

It was designed to assure conformance to projected high federal effluent quality standards and increase the potential for reclamation and reuse of water.

Development of the WMS supported an interagency agreement

between NASA and the Department of Housing and Urban Development relating to design and development of a Modular Integrated Utility System (MIUS).

Work was performed, under contract with The Boeing Co., at JSC's MIUS Integration and Subsystems Test laboratory.

Rick Brooks of Boeing, who has been involved in the WMS field testing, said last week, "We're very encouraged by the results to date. We're helping the city better understand exactly what is going on in their treatment plant."

Reuben Taylor of the E&D Systems Evaluation Office, who has directed the WMS project, was hoping to show off the system to up to 100 potential users who are in town for a Water Federation meeting.

Water parameters monitored by the WMS include general micro-

organism detection using automated chemiluminescence and bioluminescence techniques and automated total coliform and fecal coliform detection by sensing evolved metabolic hydrogen.

It also measures total organic carbon, total oxygen demand, residual chlorine, chloride, hardness, pH, turbidity, conductivity, ammonia, nitrate, total nitrogen, sodium, dissolved oxygen and temperature.

WMS provides computer-controlled sample collection and processing of on-line samples, computer controlled standardization of sensors, computerized data acquisition, formatting, plotting and hard copy report generation.

The biggest advantage of the WMS, Boeing's Brooks said, is its systems approach to water monitoring and the fact that it looks at a number of parameters which most facilities are not monitoring now but which they will be required to monitor in the future by federal law.

The bio-sensors utilized in the WMS are highly advanced. For example, Brooks said, they provide real time data on one particular measure which takes five days by standard laboratory methods.

Results of WMS analysis have been compared with the results of the City of Houston's laboratory during the field testing. Assistance has also been received from the JSC microbiology labs.

Following the field testing here, the WMS will be shipped to California where it will be turned over to Ames Research Center for installation at a Santa Clara water treatment facility.

JSC crossword answers

(See puzzle, page 3)

25	E	26	O	27	P	28	S	29	L	30	V
31	Y	32	S	33	V	34	E	35	N	36	N
37	E	38	O	39	M	40	O	41	T	42	E
43	W	44	N	45	I	46	N	47	W	48	G
49	E	50	T	51	T	52	T	53	A	54	S
55	D	56	L	57	O	58	A	59	V	60	A
61	D	62	O	63	A	64	T	65	M	66	I
67	R	68	E	69	D	70	S	71	A	72	R
73	E	74	S	75	R	76	S	77	T	78	A

Scholarship winners named by Exchange

Graduating high school seniors Jean Fulton, Randall Patterson and Mark Riley were recently selected as 1977 NASA Exchange-JSC scholarship recipients.

They will join nine students currently studying under the scholarship program.

The daughter of James R. Fulton, Data Systems and Analysis Division, Jean will graduate as class valedictorian at J. Frank Dobie High School. She is a National Merit Scholarship finalist, has received three Academic Excellence Awards and is recognized in "Who's Who Among American High School Students."

Jean is a member of the National Honor Society and the Junior Engineering and Technical Society. She will major in mathematics at Rice University.

Randall Patterson of Clear Creek High School plans to attend the University of Houston where he will major in Business Administration. He is the son of Earl B. Patterson, Flight Operations Directorate.

Randall has received several awards for maintaining the highest grade point average in the JROTC. He is a member of the National Honor Society, a semi-finalist for the National Merit Scholarship, and co-captain of the Varsity Rifle Team.

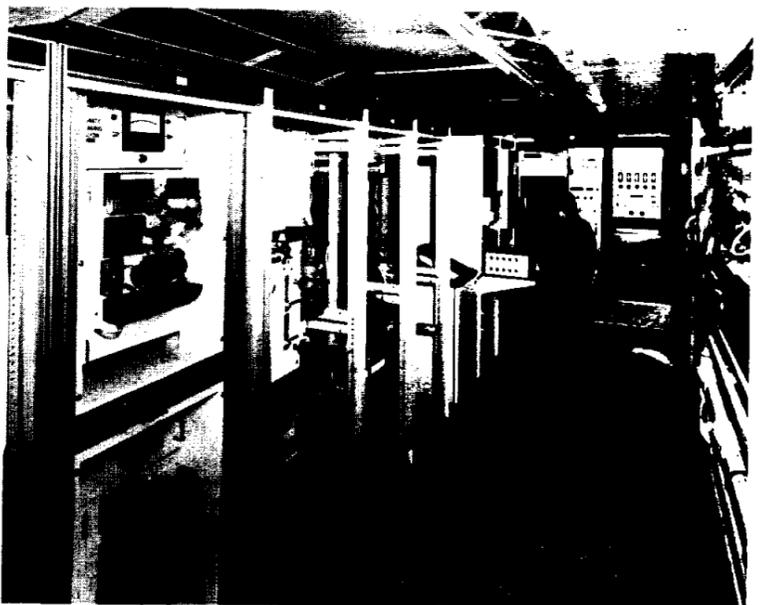
Mark Riley, son of David Riley, Institutional Procurement Division, will receive the Joseph N. Kotanchic Scholarship, awarded to a student who plans to enter the engineering field.

Mark currently attends Clear Lake High School where he is a member of the National Honor Society and is active in the Junior Engineering Technical Society. He is a National Merit Commended student and has participated in the Greater Houston Science and Engineering Fair and in Close-up, a national government study program in Washington, D.C. Mark will study chemical engineering at Texas A&M University.

Established in 1967, the scholarship fund provides a maximum of \$3,000 per student. Allowing for one year of graduate study, the students receive \$300 per semester for up to five years.

Harv Hartman chairman of the Scholarship Committee said this year's selection was particularly difficult. "It was extremely hard to choose three students among such a fine group of applicants. We are, however, quite pleased with the students selected."

Applicants are judged on scholarship, financial need and school or community involvement.



Interior of the Water Monitor System

Cultural Club plans fall trip to Colombia

Travel with the JSC Cultural Club this fall to the beautiful country of Colombia and you can combine South American culture, archeology and history with astronomy.

The tour will visit three major cities: Bogota, the capital and home of the world-famous Gold Museum; Manizales, nestled in the Andes coffee-growing region and directly in the path of the total solar eclipse to be viewed Oct. 12; and Cartagena, "a city caressed by the balmy breezes of the Caribbean and filled with the history, sites and sounds of Spanish forts, gold-filled galleons and stalking pirates."

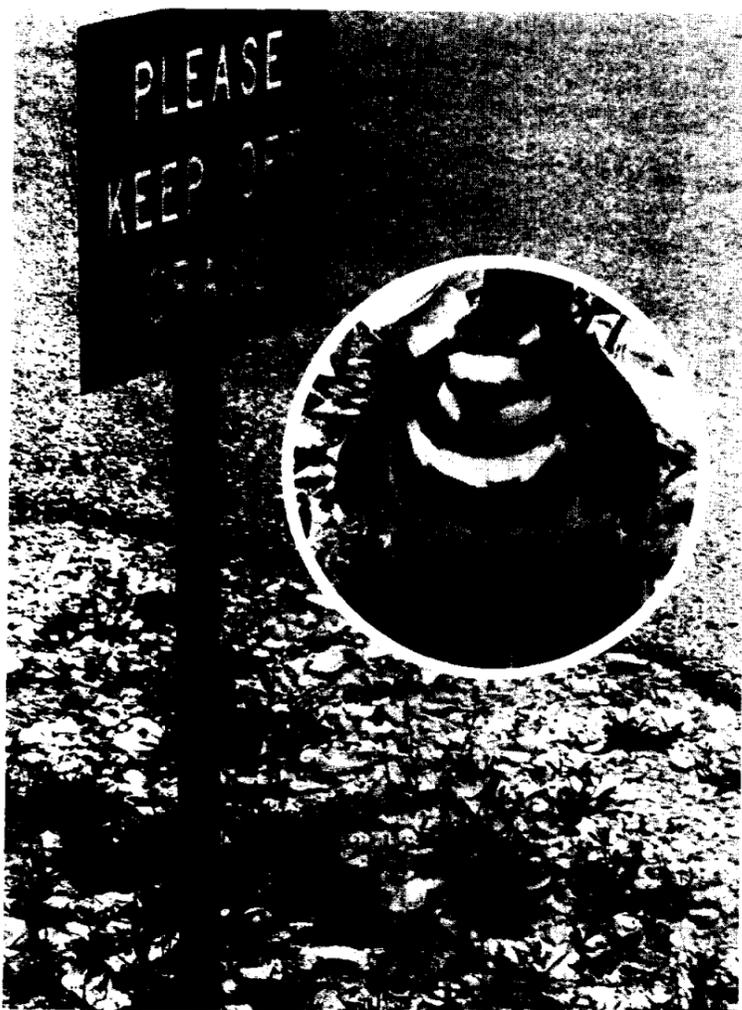
The price of \$498 covers round-

trip jet fare from Houston and within Colombia. Scheduled departure is Oct. 9, returning Oct. 15. This includes the Oct. 10 federal holiday.

Also included are seven days and six nights in luxury hotels, airport transfers, baggage handling, gratuities and guided tours to points of interest.

The trip will be personally escorted from Houston by a native Colombian who will provide assistance and advice to maximize tourist enjoyment.

For more information, call Tom Gallagher at X-2657 or ask for detailed brochure from Gonzalo Montoya at 337-2406.



WATCH THE BIRDIE - Concerned employees in Bldg. 44 place this sign to keep passersby from running over the female killdeer who laid four eggs on the shell shoulder only inches from the roadway outside their building (bottom right and inset). The bird sits patiently on her eggs and usually only gets aroused when photographers or shuttle bus passengers get too close.